

ABSTRACT OF THE DISCLOSURE

An impedance spectroscopy technique and system for detecting in real time engine coolant contamination in lubricant. A probe is disposed in the lubricant and the probe excited with an a.c. voltage frequency sweep over a selected frequency range. The current and current phase angle are measured at selected frequency intervals and the reactance and resistance computed and plotted at each frequency interval as Nyquist plots. The Nyquist minimum is determined at various lubricant temperatures and a database compiled. The probe is then excited in-situ and current measurements taken for a selected frequency lower than the Nyquist minimum to insure measurement of electrode surfaces characteristics. The reactance and resistance are then computed and the angle Θ of change (slope) of reactance with respect to resistance computed. The value of Θ is then compared with values of contamination concentration Ψ versus Θ in a database, and the value of Ψ determined by interpolation.